Pioneer *sound.vision.soul*

Service Manual

GM-X372/XH/UC

ORDER NO.
CRT3006

BRIDGEABLE POWER AMPLIFIER

GM-X372 XH/UC,XH/EW,XH/ES

For details, refer to "Important symbols for good services".

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K-ZZY. NOV. 2002 Printed in Japan

SAFETY INFORMATION

● GM-X372/XH/UC

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

[Important symbols for good services]
In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely.
When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety

You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments

To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning

For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws

To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts

Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount.For replacement parts or tools, the prescribed ones should be used.

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1. SPECIFICATIONS

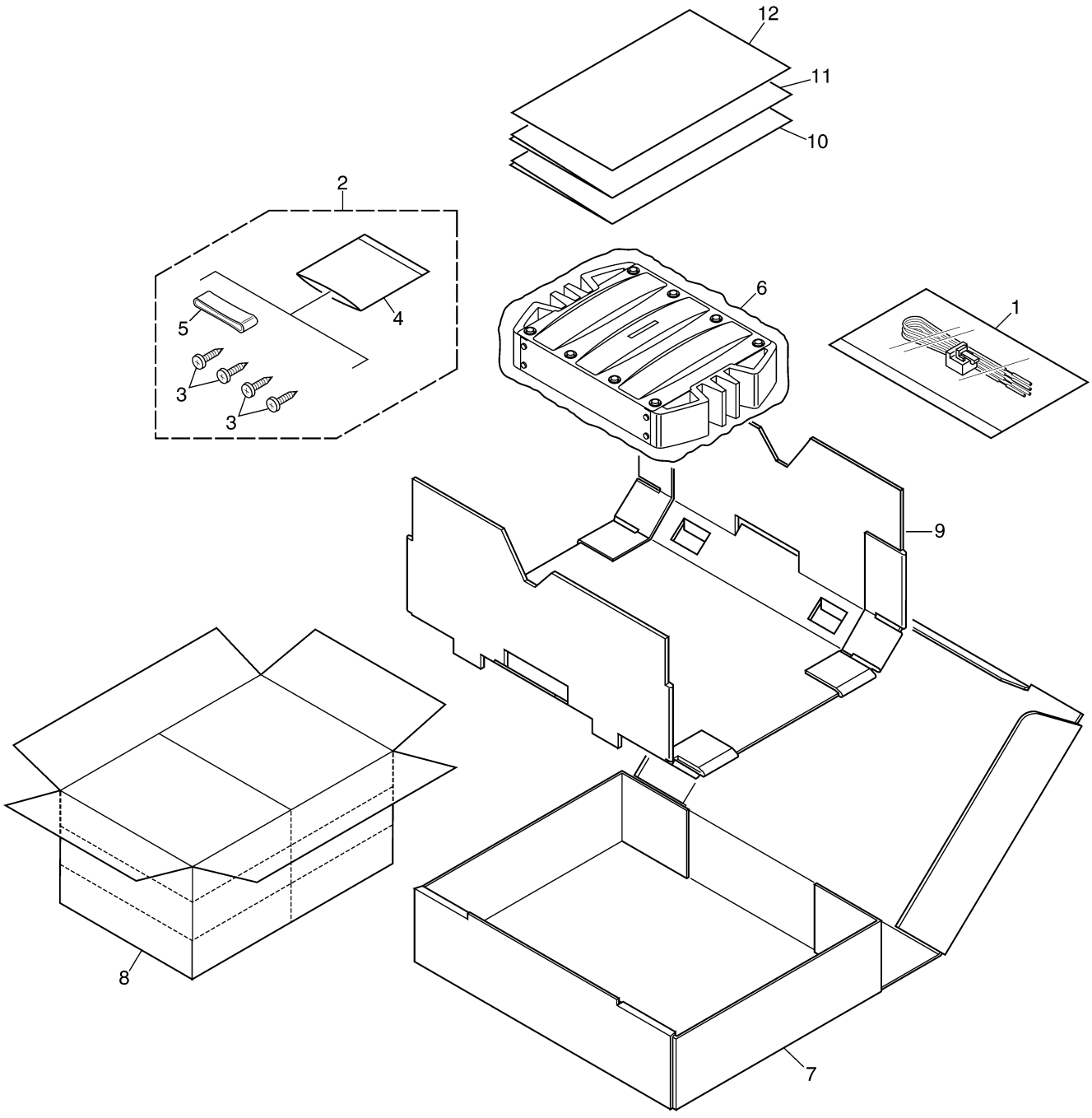
Power source	14.4 V DC (10.8 — 15.1 V allowable)
Grounding system	Negative type
Current consumption	14.4 A (at continuous power, 4 Ω)
Backup current	3.0 mA or less
Average current drawn*	5.0 A (4 Ω for two channels) 7.5 A (4 Ω for one channel)
Fuse	25 A × 1
Dimensions	255 (W) × 50 (H) × 169 (D) mm [10 (W) × 2 (H) × 6-5/8 (D) in]
Weight	2.0 kg (4.4 lbs) (Leads for wiring not included)
Maximum power output	100 W × 2 / 240 W × 1
Continuous power output	50 W × 2 (at 14.4 V, 4 Ω, 20 — 20,000 Hz, 0.15% THD) 120 W × 1 (at 14.4 V, 4 Ω, 20 — 20,000 Hz, 0.8% THD) 60 W × 2 (at 14.4 V, 2 Ω, 20 — 20,000 Hz, 0.8% THD)
Load impedance	4 Ω (2 — 8 Ω allowable) (Bridge connection: 4 — 8 Ω allowable)
Frequency response	10 — 50,000 Hz (+0 dB, –1 dB)
Signal-to-noise ratio	100 dB (IHF–A network)
Distortion	0.008% (10 W, 1 kHz)
Separation	60 dB (1 kHz)
Low pass filter	Cut off frequency: 80 Hz Cut off slope: –12 dB/oct
Maximum input level/impedance	RCA: 6.5 V/22 kΩ (0.2 — 6.5 V) Speaker: 26 V/40 kΩ (0.8 — 26 V)

Note:
- Specifications and the design are subject to possible modification without notice due to improvements.

***Average current drawn**
- The average current drawn is nearly the maximum current drawn by this unit when an audio signal is input. Use this value when working out total current drawn by multiple power amplifiers.

2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING



NOTE:

- Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.
- For the applying amount of lubricants or glue, follow the instructions in this manual.
  (In the case of no amount instructions, apply as you think it appropriate.)

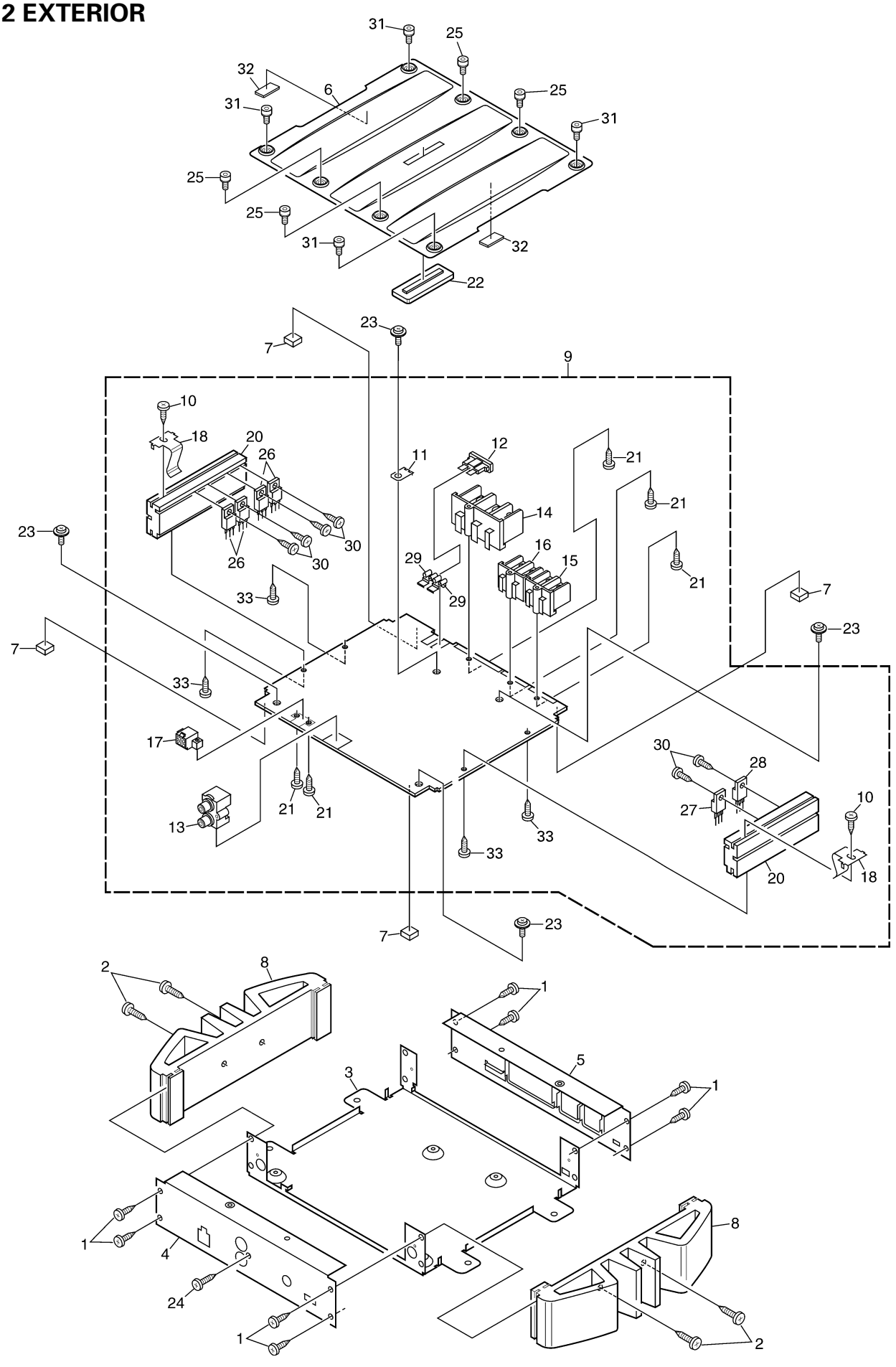
● PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Cord	HDE0044
	2	Screw Assy	HEA0058
	3	Screw	BYC40P180FZK
	4	Polyethylene Bag	HEG0011
	5	Cover	HNS0101
	6	Polyethylene Bag	HEG0013
	7	Carton	HHG0341
	8	Contain Box	HHL0341
	9	Protector	HHP0170
	10	Owner's Manual(UC)	HRD0226
		Owner's Manual(EW)	HRD0227
		Owner's Manual(ES)	HRD0228
	11	Owner's Manual(ES)	HRD0229
*	12	Warranty Card	HRY1157

● Owner's Manual

Part No.	Language
HRD0226	English, French
HRD0227	English, French, Spanish, German, Italian, Dutch
HRD0228	English, Spanish
HRD0229	Portuguese(B), Arabic

2.2 EXTERIOR


31
25
32
6
25
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31
25
25
31
32
22
23
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10
18
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12
21
21
14
23
26
30
30
16
15
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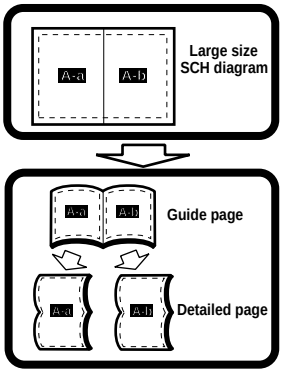
29
21
33
7
7
23
33
17
21
21
30
28
27
10
13
33
33
20
18
7
23
2
8
1
5
3
1
1
4
24
1
8
2

● EXTERIOR SECTION PARTS LIST

Mark No.	Description	Part No.
1	Screw	BBZ30P060FZK
2	Screw	BBZ30P110FZK
3	Chassis	HNA0015
4	Panel	HNB0187
5	Panel	HNB0191
6	Case	HNB0196
7	Spacer	HNM0124
8	Heat Sink	HNR0236
9	Amp Unit(UC)	HWH0201
	Amp Unit(EW)	HWH0202
	Amp Unit(ES)	HWH0203
10	Screw	BBZ30P050FZK
11	Terminal(CN604)	CKF1059
12	Fuse(25A)	HEK0025
13	Pin Jack(CN801)	HKB0020
14	Terminal(CN601)	HKE0048
15	Terminal(CN851)	HKE0049
16	Terminal(CN852)	HKE0049
17	Connector(CN803)	HKM1077
18	Clip	HNC0145
19	•••••	
20	Heat Sink	HNR0237
21	Screw	PPZ30P100FZK
22	Light Pipe Unit	HXA0391
23	Screw	ISS30P055FUC
24	Screw	PPZ30P100FZK
25	Screw	HBA0029
26	FET(Q612,613,614,615)	STP55NF06FP
27	Diode(D611)	FML22R
28	Diode(D612)	FML22S
29	Holder	HNC0082
30	Screw	BBZ30P080FMC
31	Screw	HBA0030
32	Cushion	HNM6623
33	Screw	BBZ30P060FZK

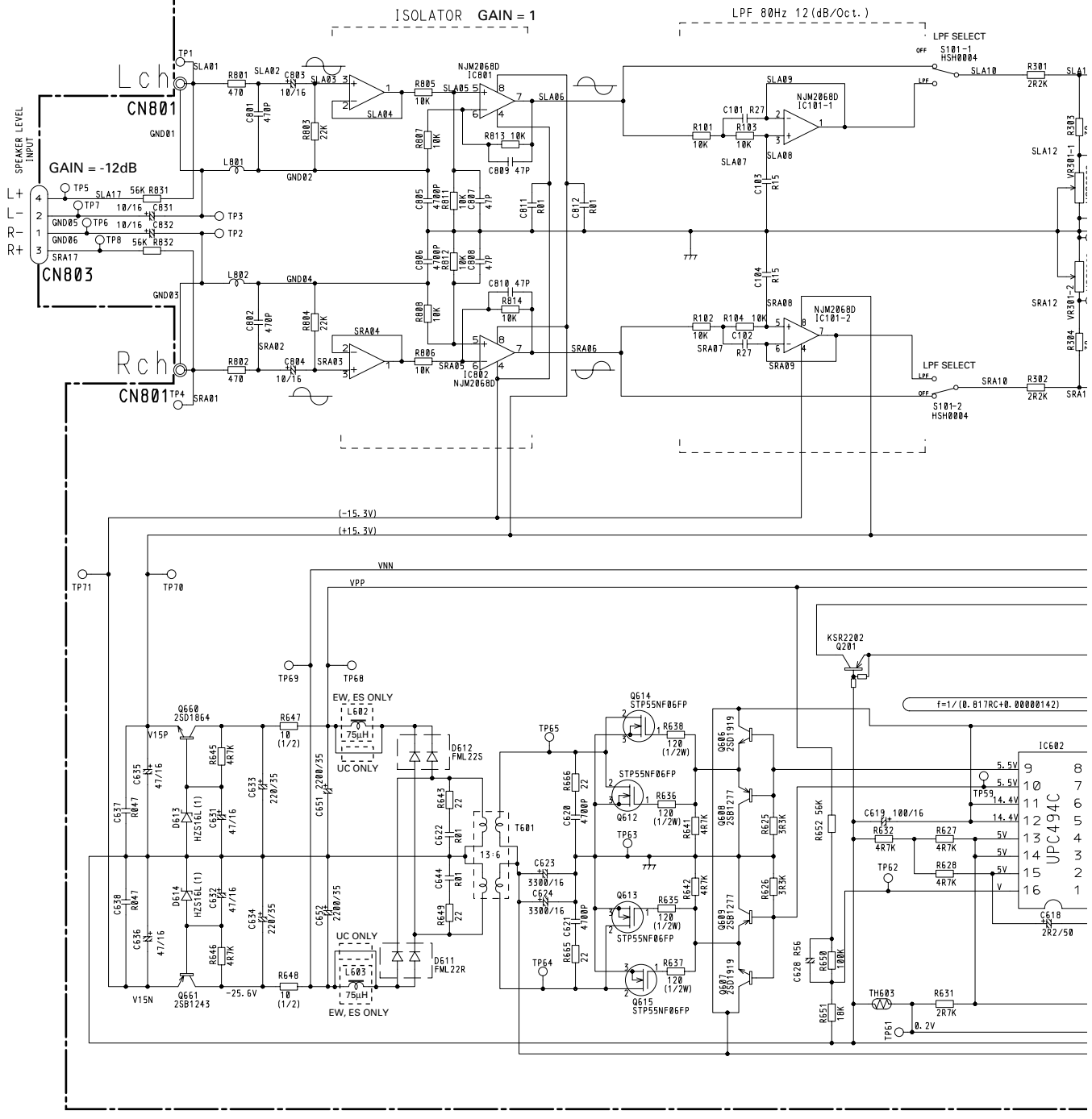
3. SCHEMATIC DIAGRAM

3.1 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

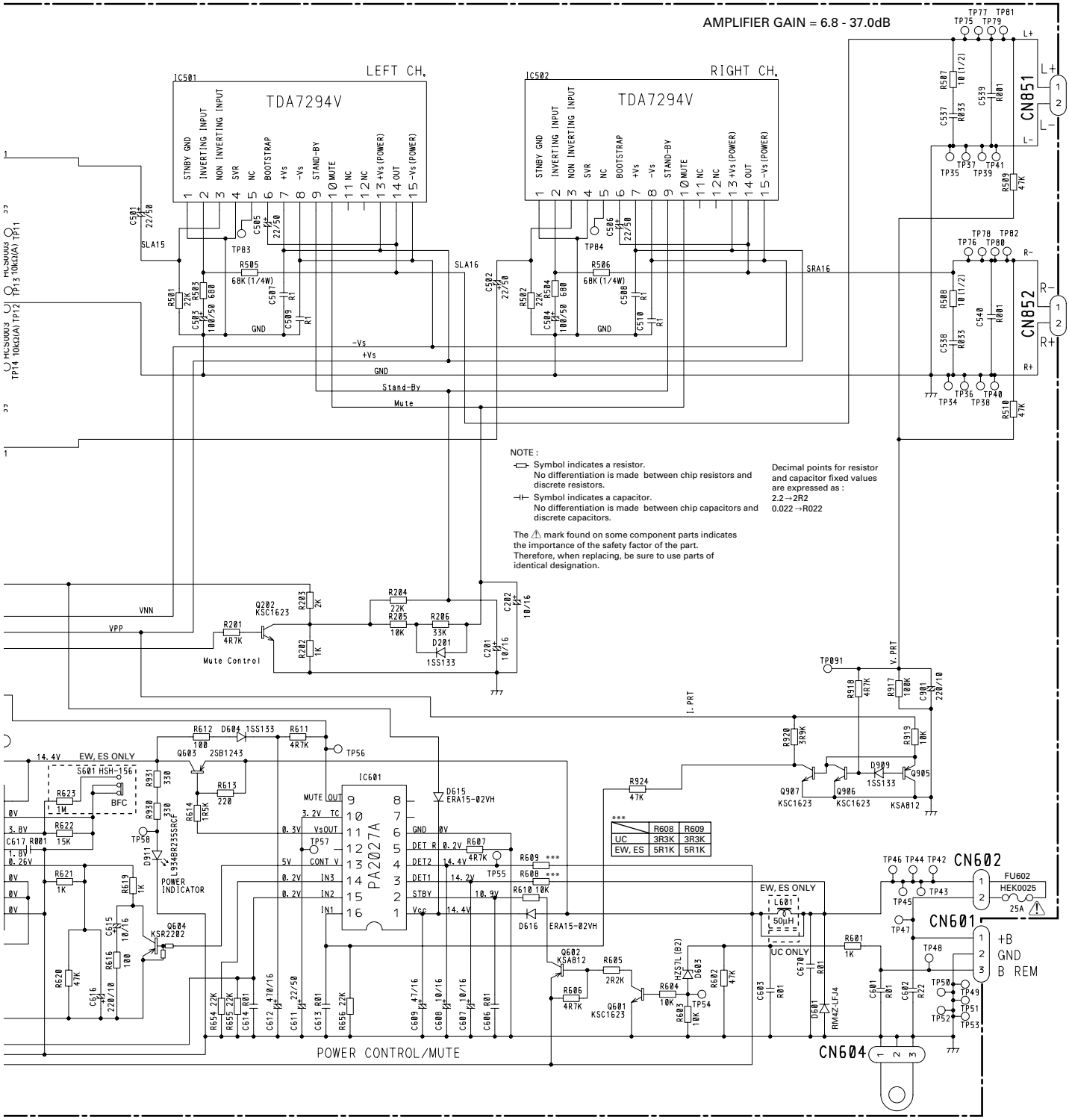


A-a

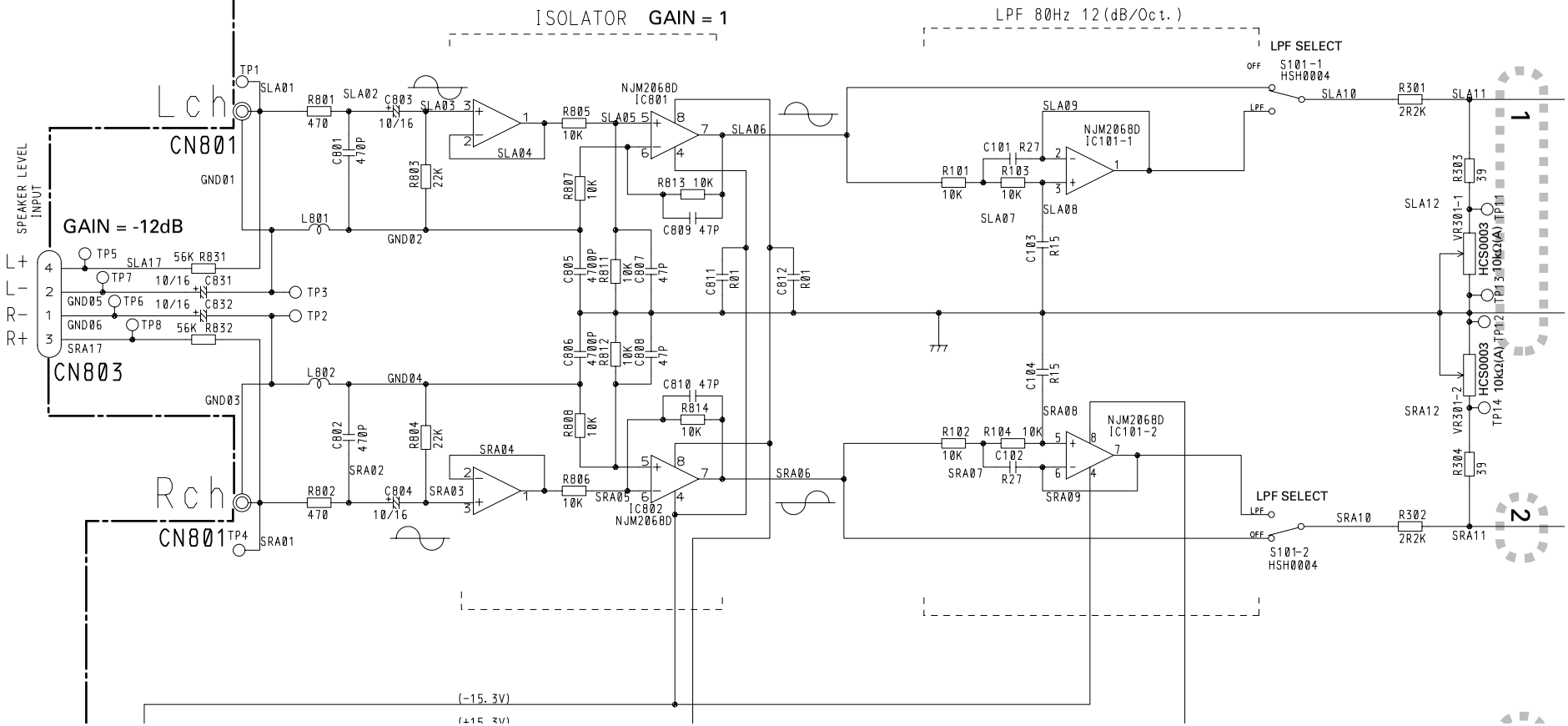
A AMP UNIT

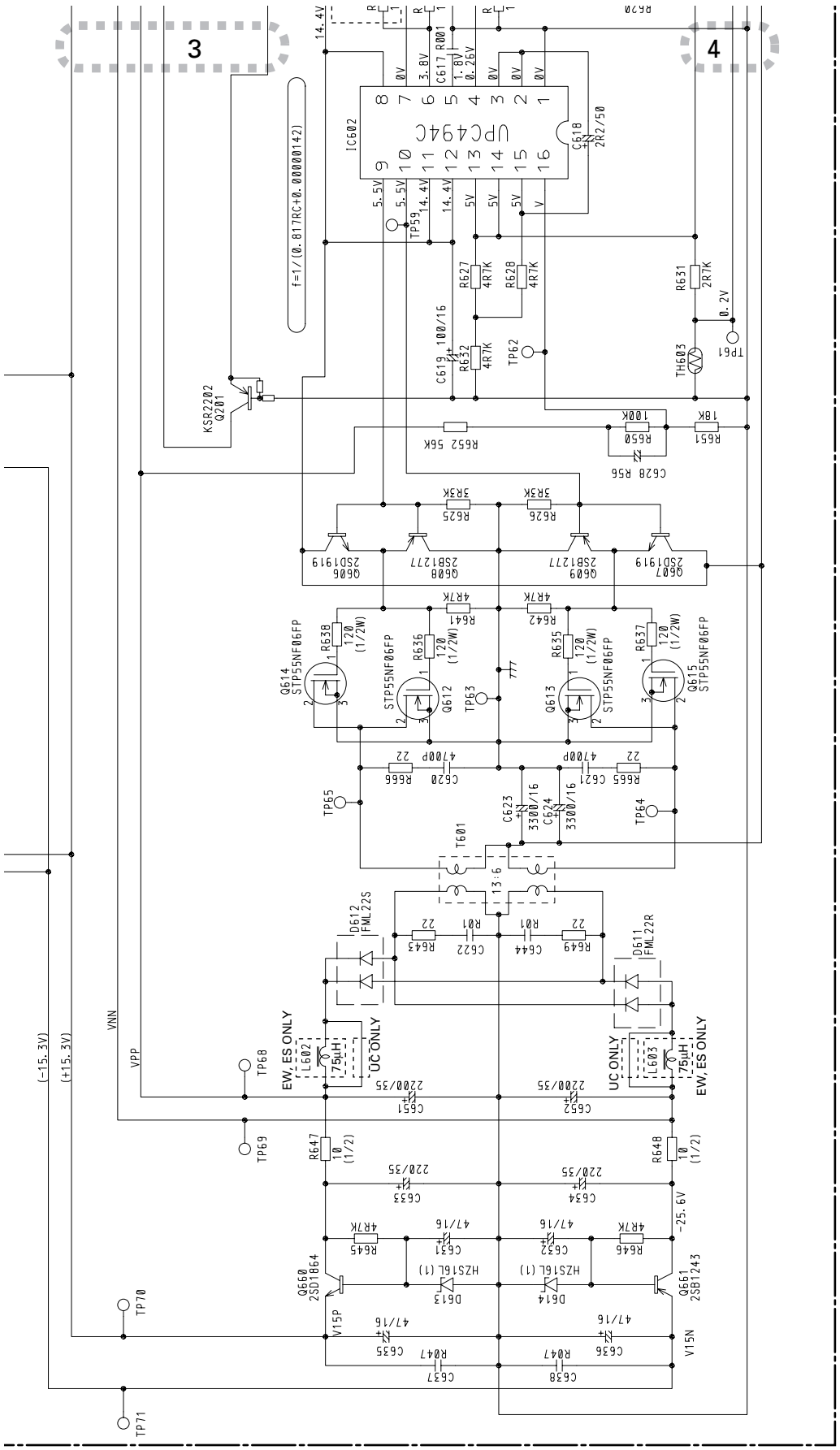


A-b

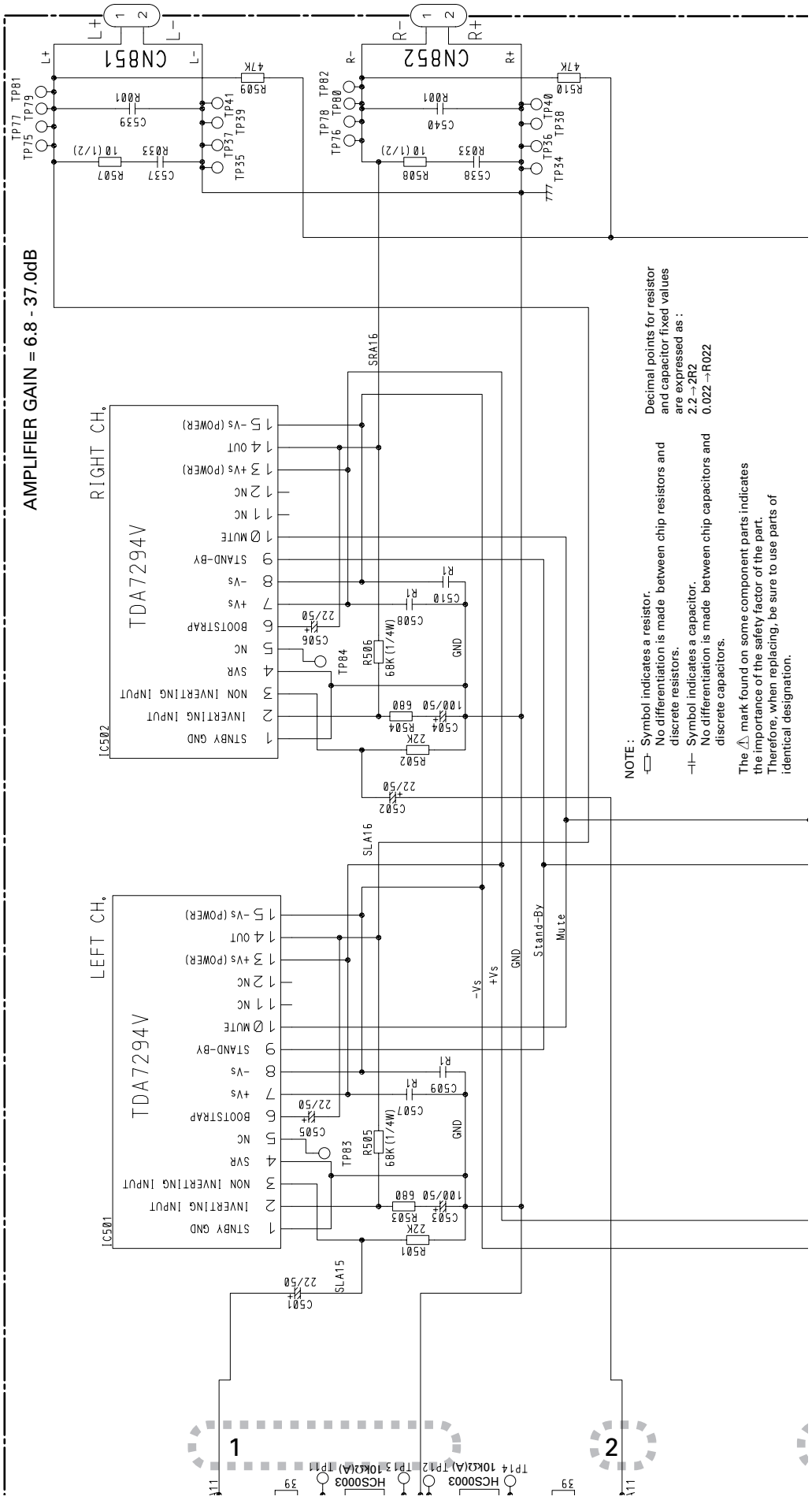

AMPLIFIER GAIN = 6.8 - 37.0dB
LEFT CH.
RIGHT CH.
IC501
IC502
TDA7294V
STNBY GND
INVERTING INPUT
NON INVERTING INPUT
SVR
NC
BOOTSTRAP
+Vs
-Vs
STAND-BY
MUTE
NC
NC
+Vs (POWER)
OUT
-Vs (POWER)
CN851
CN852
CN602
CN601
CN604
FU602
HEK0025
25A
+B
GND
B REM
SLA15
SLA16
SRA16
GND
-Vs
+Vs
GND
Stand-By
Mute
VNN
VPP
Mute Control
Q202 KSC1623
D201 1SS133
Q907 KSC1623
Q906 KSC1623
Q905 KSA812
D909 1SS133
V.PRT
I.PRT
14.4V
EW, ES ONLY
S601 HSH-156
BFC
POWER INDICATOR
L934RB23SSRCF
IC601
PA2027A
MUTE
VsOUT
CONT V
IN3
IN2
IN1
STBY
Vcc
GND
DET R
DET2
DET1
D615 ERA15-02VH
D616 ERA15-02VH
Q602 KSA812
Q601 KSC1623
Q604 KSR2202
Q603 2SB1243
L601 50μH
UC ONLY
POWER CONTROL/MUTE
R608 R609
UC 3R3K 3R3K
EW, ES 5R1K 5R1K
NOTE :
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

A AMP UNIT


ISOLATOR GAIN = 1
LPF 80Hz 12(dB/Oct.)
Lch
Rch
CN801
CN803
SPEAKER LEVEL INPUT
GAIN = -12dB
NJM2068D
IC801
IC802
IC101-1
IC101-2
LPF SELECT
S101-1
HSH0004
S101-2
HSH0004
(-15.3V)
(+15.3V)


3
4
IC602
UPC494C
f=1/(0.817RC+0.000000142)
KSR2202
Q201
TH603
TP61
TP62
TP63
TP64
TP65
TP68
TP69
TP70
TP71
T601
13:6
Q614
STP55NF06FP
Q612
Q613
Q615
Q606
2SD1919
Q607
2SD1919
Q608
2SB1277
Q609
2SB1277
Q660
2SD1864
Q661
2SB1243
D611
FML22R
D612
FML22S
D613
HZS16L (1)
D614
HZS16L (1)
L602
75μH
L603
75μH
UC ONLY
EW, ES ONLY
VNN
VPP
(-15.3V)
(+15.3V)
V15P
V15N
-25.6V
14.4V
5.5V
5V
3.8V
1.8V
0.26V
0V
0.2V

A-b
A-a


AMPLIFIER GAIN = 6.8 - 37.0dB
CN851
CN852
L+
L-
R+
R-
RIGHT CH.
LEFT CH.
TDA7294V
IC502
IC501
SRA16
SLA16
SLA15
-Vs
+Vs
GND
Stand-By
Mute
NOTE :
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
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Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.

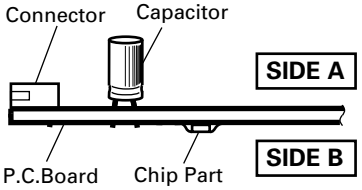
	R608	R609
UC	3R3K	3R3K
EW, ES	5R1K	5R1K

4. PCB CONNECTION DIAGRAM

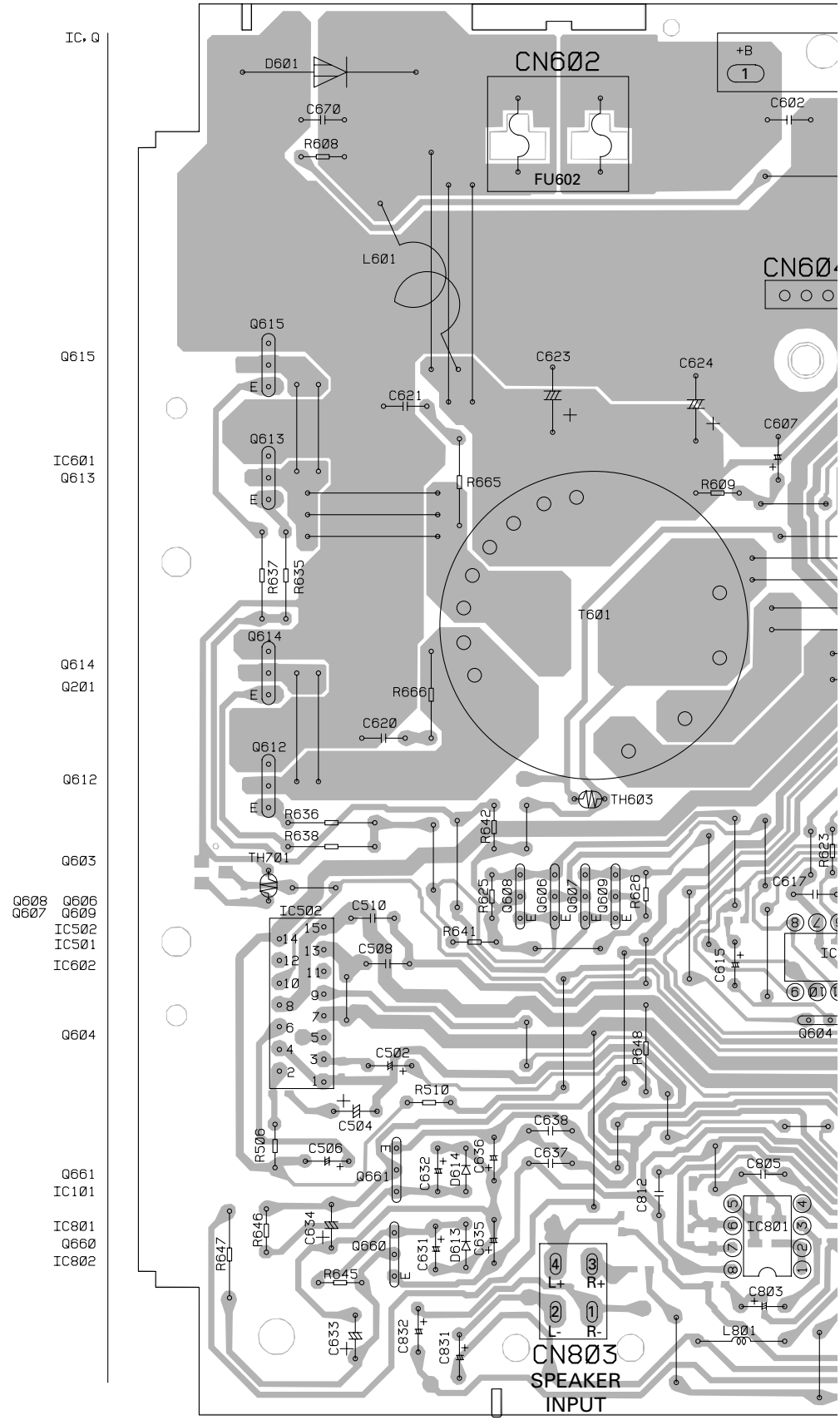
4.1 AMP UNIT

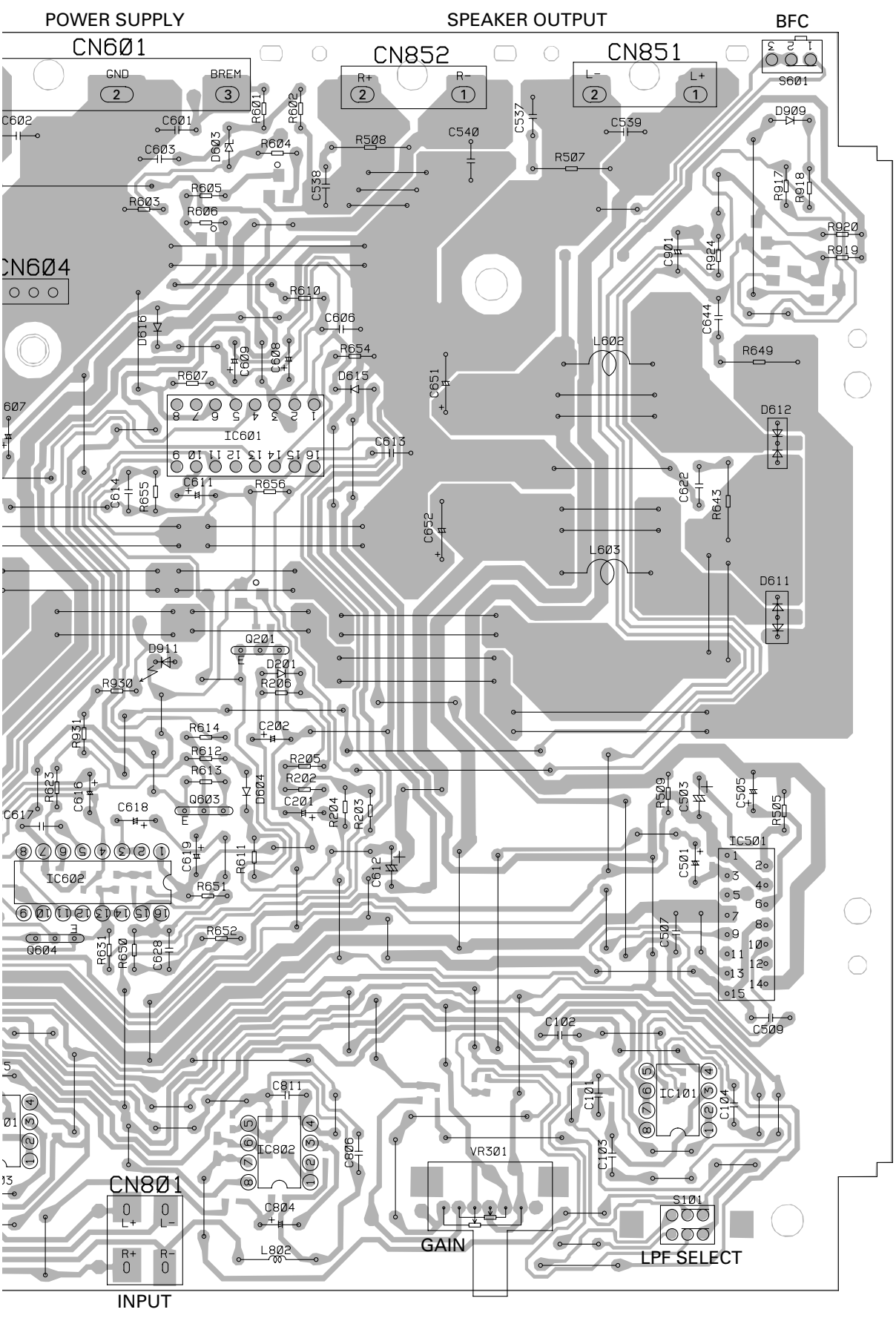
NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination. For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams

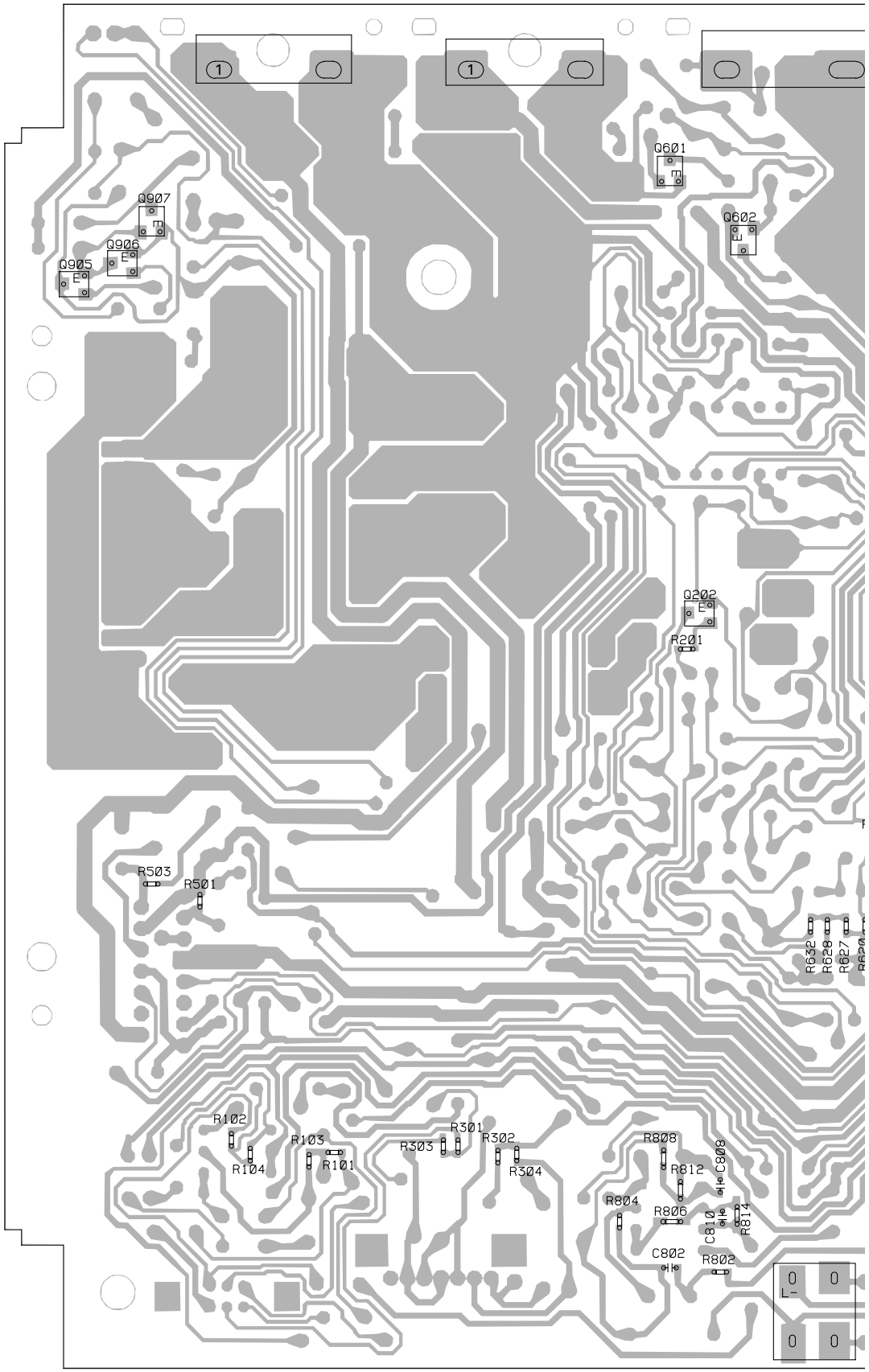


A AMP UNIT

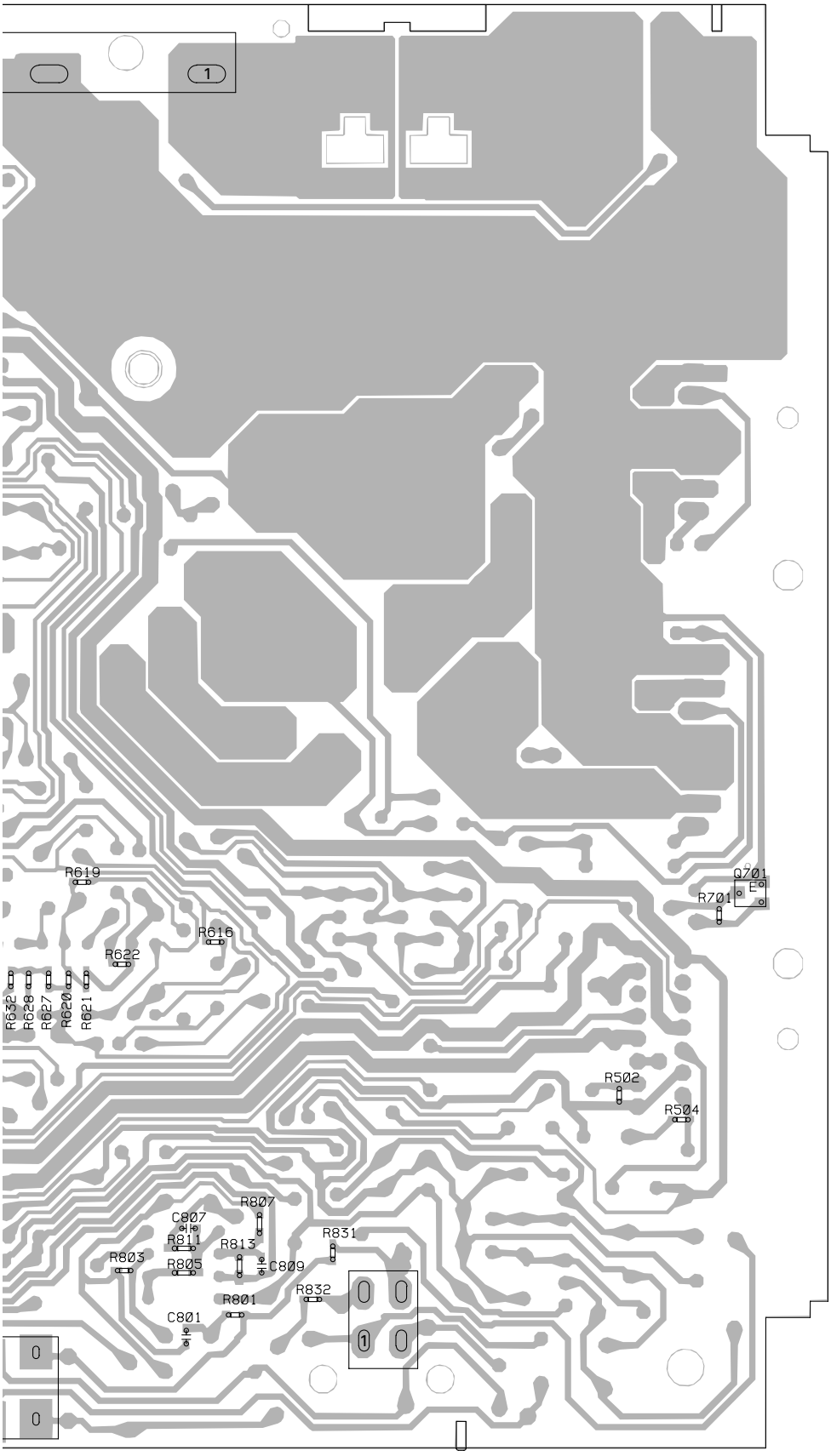



POWER SUPPLY
SPEAKER OUTPUT
BFC
SIDE A
CN601
GND
BREM
CN852
R+
R-
CN851
L-
L+
S601
CN604
CN801
L+
L-
R+
R-
INPUT
GAIN
VR301
LPF SELECT
S101
IC601
IC602
IC501
IC802
IC101
L602
L603
Q201
Q603
Q604
D909
D612
D611
D911
D201
D615
D604
C537
C538
C539
C540
C651
C652
C644
C901
C102
C509
C811
C804
L802
R507
R508
R649
R654
R656
R930
R920
R921
R917
R918
R924
A
B
C
D
E
F

A AMP UNIT


Q601
Q602
Q907
Q906
Q905
Q202
R201
R503
R501
R632
R628
R627
R102
R104
R103
R101
R301
R303
R302
R304
R808
R812
C808
R804
R806
C810
R811
C802
R802

SIDE B



IC, Q

Q601

Q907
Q602

Q906
Q905

Q202

Q701

5. ELECTRICAL PARTS LIST

NOTES:

● Parts whose parts numbers are omitted are subject to being not supplied.

● The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

A Unit Number : HWH0201 (UC)
: HWH0202 (EW)
: HWH0203 (ES)

Unit Name : Amp Unit

MISCELLANEOUS

=====Circuit Symbol and No.		===Part Name	Part No.
IC	101	IC	NJM2068D
IC	501	IC	TDA7294V
IC	502	IC	TDA7294V
IC	601	IC	PA2027A
IC	602	IC	UPC494C
IC	801	IC	NJM2068D
IC	802	IC	NJM2068D
Q	201	Transistor	KSR2202
Q	202	Transistor	KSC1623
Q	601	Transistor	KSC1623
Q	602	Transistor	KSA812
Q	603	Transistor	2SB1243
Q	604	Transistor	KSR2202
Q	606	Transistor	2SD1919
Q	607	Transistor	2SD1919
Q	608	Transistor	2SB1277
Q	609	Transistor	2SB1277
Q	612	FET	STP55NF06FP
Q	613	FET	STP55NF06FP
Q	614	FET	STP55NF06FP
Q	615	FET	STP55NF06FP
Q	660	Transistor	2SD1864
Q	661	Transistor	2SB1243
Q	905	Transistor	KSA812
Q	906	Transistor	KSC1623
Q	907	Transistor	KSC1623
D	201	Diode	1SS133
D	601	Diode	RM4Z-LFJ4
D	603	Diode	HZS7L(B2)
D	604	Diode	1SS133
D	611	Diode	FML22R
D	612	Diode	FML22S
D	613	Diode	HZS16L(1)
D	614	Diode	HZS16L(1)
D	615	Diode	ERA15-02VH
D	616	Diode	ERA15-02VH
D	909	Diode	1SS133
D	911	LED	L934BR235SRCF
L	601	Choke Coil 50µH (EW, ES)	HTH0005
L	602	Choke Coil 75µH (EW, ES)	HTH0010
L	603	Choke Coil 75µH (EW, ES)	HTH0010
L	801	Ferri-Inductor	CTF1007
L	802	Ferri-Inductor	CTF1007
T	601	Transformer	HTT0015
TH	603	Thermistor	HCX0001
S	101	Switch(LPF SELECT)	HSH0004
S	601	Switch(BFC) (EW, ES)	HSH-156
VR	301	Volume 10kΩ(A)	HCS0003
FU	602	Fuse(25A)	HEK0025

RESISTORS

=====Circuit Symbol and No.		===Part Name	Part No.
R	101		RS1/16S103J
R	102		RS1/16S103J
R	103		RS1/16S103J
R	104		RS1/16S103J
R	201		RS1/16S472J
R	202		RD1/4PU102J
R	203		RD1/4PU202J
R	204		RD1/4PU223J
R	205		RD1/4PU103J
R	206		RD1/4PU333J
R	301		RS1/16S222J
R	302		RS1/16S222J
R	303		RS1/16S390J
R	304		RS1/16S390J
R	501		RS1/16S223J
R	502		RS1/16S223J
R	503		RS1/16S681J
R	504		RS1/16S681J
R	505		RD1/4PU683J
R	506		RD1/4PU683J
R	507		RS1/2PMF100J
R	508		RS1/2PMF100J
R	509		RD1/4PU473J
R	510		RD1/4PU473J
R	601		RD1/4PU102J
R	602		RD1/4PU473J
R	603		RD1/4PU103J
R	604		RD1/4PU103J
R	605		RD1/4PU222J
R	606		RD1/4PU472J
R	607		RD1/4PU472J
R	608	(UC)	RD1/4PU332J
R	608	(EW, ES)	RD1/4PU512J
R	609	(UC)	RD1/4PU332J
R	609	(EW, ES)	RD1/4PU512J
R	610		RD1/4PU103J
R	611		RD1/4PU472J
R	612		RD1/4PU101J
R	613		RD1/4PU221J
R	614		RD1/4PU152J
R	616		RS1/16S101J
R	619		RS1/16S102J
R	620		RS1/16S473J
R	621		RS1/16S102J
R	622		RS1/16S153J

=====Circuit Symbol and No.		===Part Name	Part No.
R	623	(EW, ES)	RD1/4PU105J
R	625		RD1/4PU332J
R	626		RD1/4PU332J
R	627		RS1/16S472J
R	628		RS1/16S472J
R	631		RD1/4PU272J
R	632		RS1/16S472J
R	635		RS1/2PMF121J
R	636		RS1/2PMF121J
R	637		RS1/2PMF121J
R	638		RS1/2PMF121J
R	641		RD1/4PU472J
R	642		RD1/4PU472J
R	643		RS1/2PMF220J
R	645		RD1/4PU472J
R	646		RD1/4PU472J
R	647		RS1/2PMF100J
R	648		RS1/2PMF100J
R	649		RS1/2PMF220J
R	650		RD1/4PU104J
R	651		RD1/4PU183J
R	652		RD1/4PU563J
R	654		RD1/4PU223J
R	655		RD1/4PU223J
R	656		RD1/4PU223J
R	665		RS1/2PMF220J
R	666		RS1/2PMF220J
R	801		RS1/16S471J
R	802		RS1/16S471J
R	803		RS1/16S223J
R	804		RS1/16S223J
R	805		RN1/10SE1002D
R	806		RN1/10SE1002D
R	807		RN1/10SE1002D
R	808		RN1/10SE1002D
R	811		RN1/10SE1002D
R	812		RN1/10SE1002D
R	813		RN1/10SE1002D
R	814		RN1/10SE1002D
R	831		RS1/16S184J
R	832		RS1/16S184J
R	917		RD1/4PU104J
R	918		RD1/4PU472J
R	919		RD1/4PU103J
R	920		RD1/4PU392J
R	924		RD1/4PU473J
R	930		RD1/4PU331J
R	931		RD1/4PU331J

CAPACITORS

C	101		CFTNA274J50
C	102		CFTNA274J50
C	103		CFTNA154J50
C	104		CFTNA154J50
C	201		CEAT100M16
C	202		CEAT100M16
C	501		CEAT220M50
C	502		CEAT220M50
C	503		CEAT101M50
C	504		CEAT101M50
C	505		CEAT220M50
C	506		CEAT220M50
C	507		CFTNA104J50
C	508		CFTNA104J50
C	509		CFTNA104J50
C	510		CFTNA104J50
C	537		CFTNA333J50
C	538		CFTNA333J50
C	539		CQMA102J50
C	540		CQMA102J50
C	601		CFTNA103J50
C	602		CFTNA224J50
C	603		CFTNA103J50
C	606		CFTNA103J50
C	607		CEAT100M16
C	608		CEAT100M16
C	609		CEAT470M16
C	611		CEAT220M50
C	612	470µF/16V	HCH0013
C	613		CFTNA103J50
C	614		CFTNA103J50
C	615		CEAT100M16
C	616		CEAT221M10
C	617		CQMA102J50
C	618		CEAT2R2M50
C	619		CEAT101M16
C	620		CQMA472J50
C	621		CQMA472J50
C	622		CQMA103J50
C	623	3300µF/16V	HCH0005
C	624	3300µF/16V	HCH0005
C	628		CFTNA564J50
C	631		CEAT470M16
C	632		CEAT470M16
C	633		CEAT221M35
C	634		CEAT221M35
C	635		CEAT470M16
C	636		CEAT470M16
C	637		CFTNA473J50
C	638		CFTNA473J50
C	644		CQMA103J50
C	651	2200µF/35V	HCH0003
C	652	2200µF/35V	HCH0003
C	670		CQMA103J50
C	801		CCSRCH471J50
C	802		CCSRCH471J50
C	803		CEAT100M16
C	804		CEAT100M16
C	805		CQMA472J50
C	806		CQMA472J50
C	807		CCSRCH470J50
C	808		CCSRCH470J50
C	809		CCSRCH470J50
C	810		CCSRCH470J50
C	811		CFTNA103J50
C	812		CFTNA103J50
C	831		CEAT100M16
C	832		CEAT100M16
C	901	220µF/10V	HCH0012

6. ADJUSTMENT

There is no information to be shown in this chapter.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● **Removing the Case (not shown)**

1. Remove the eight screws and then remove the Case.

● **Removing the Amp Unit (Fig.1)**

1 Remove the eight screws.

2 Remove the screw and then remove the two Panels.

3 Remove the four screws and then remove the two Heat Sinks.

4 Remove the four screws and then remove the Amp Unit.

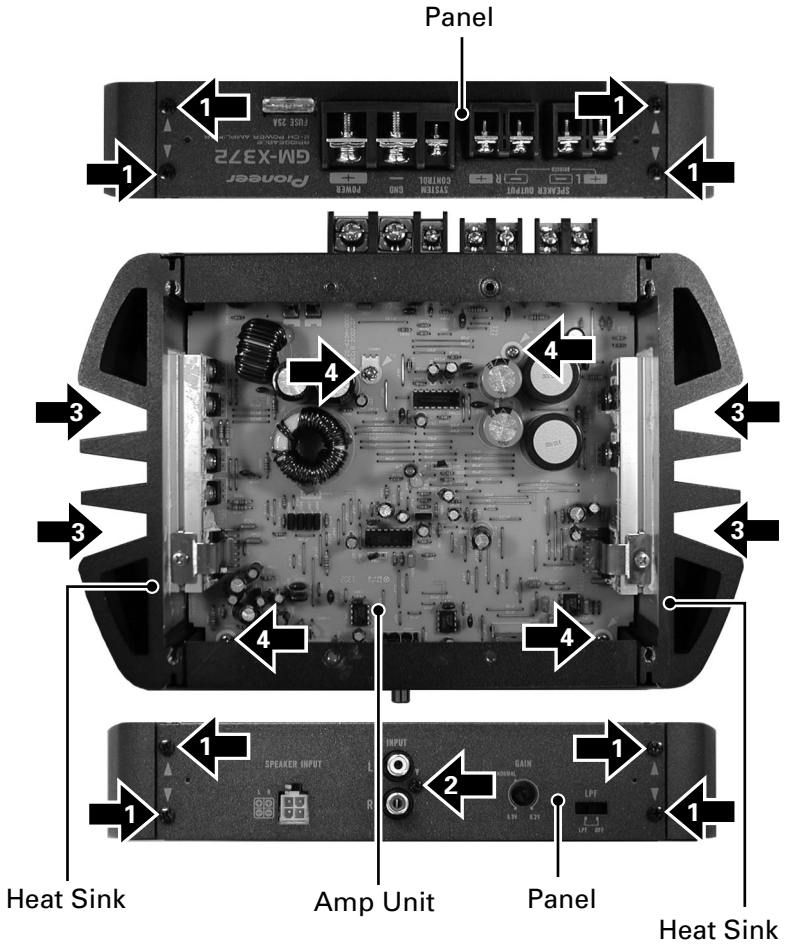
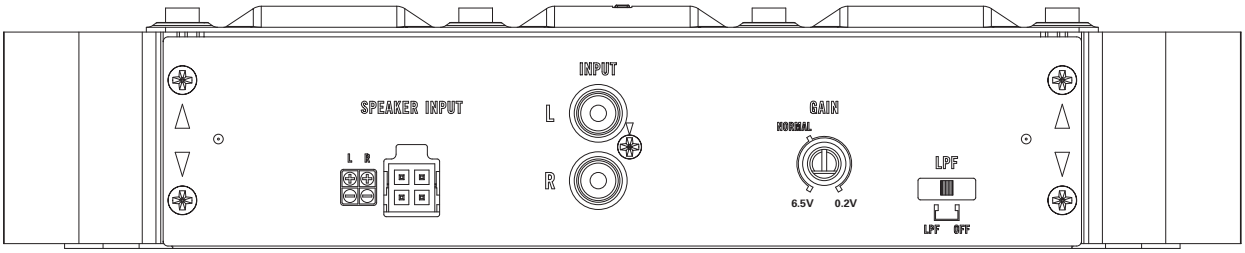
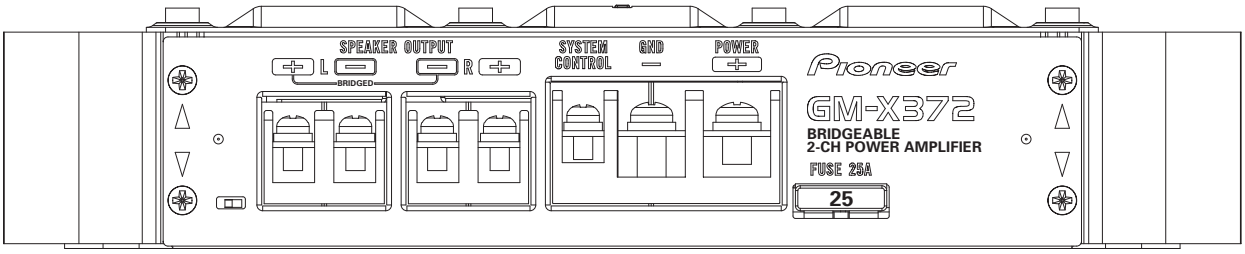


Fig.1

7.1.2 CONNECTOR FUNCTION DESCRIPTION

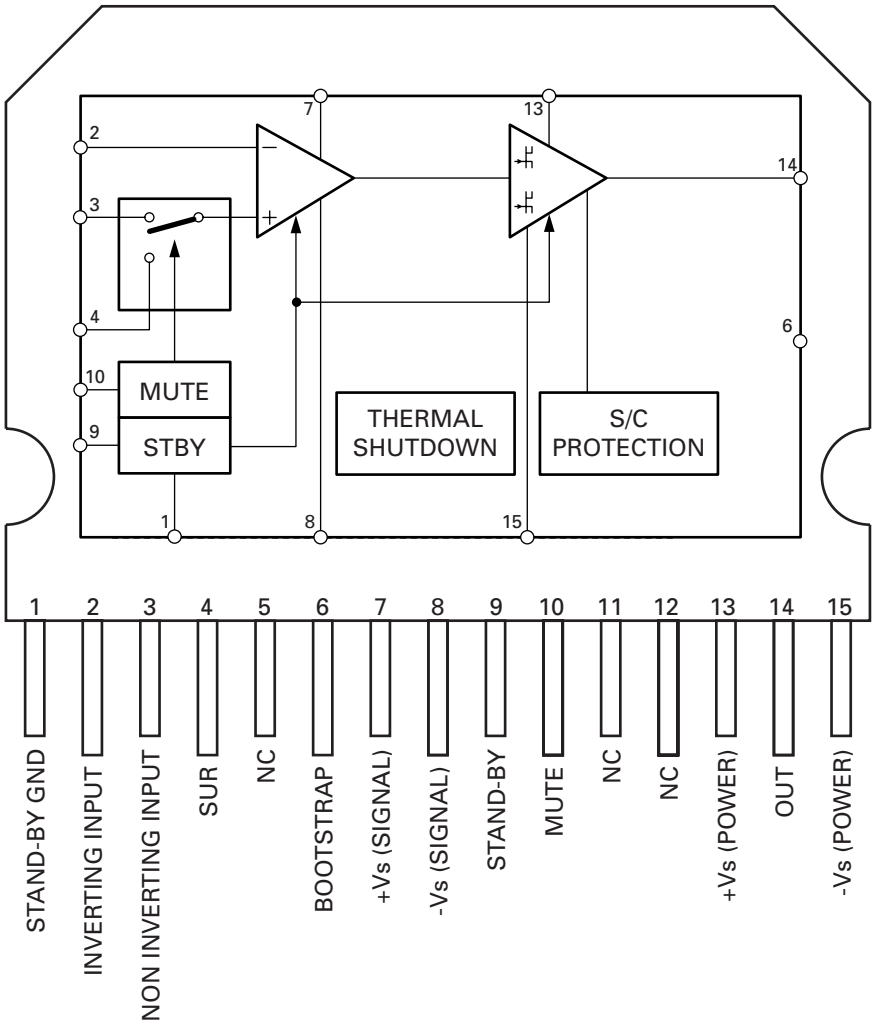
● GM-X372/XH/UC





7.2 IC

*TDA7294V



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

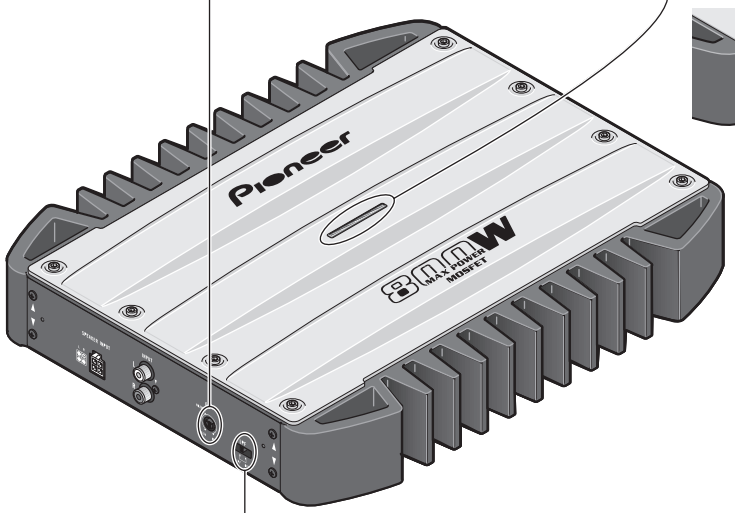
Gain Control

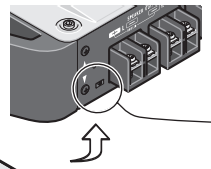
If the sound level is too low, even when the volume of the car stereo used along with this power amplifier is turned up, turn gain control on the front of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the gain control counter-clockwise.

- When using with an RCA equipped car stereo (standard output of 500 mV), set to the NORMAL position. When using with an RCA equipped Pioneer car stereo with max. output of 4 V or more, adjust level to match the car stereo output level.
- If you hear too much noise when using the speaker input terminals, turn the gain control counter-clockwise.

Power Indicator

The power indicator lights when the power is switched on.





BFC (Beat Frequency Control) Switch

If you hear a beat while listening to an MW/LW broadcast with your car stereo, change the BFC switch using a small standard tip screwdriver.

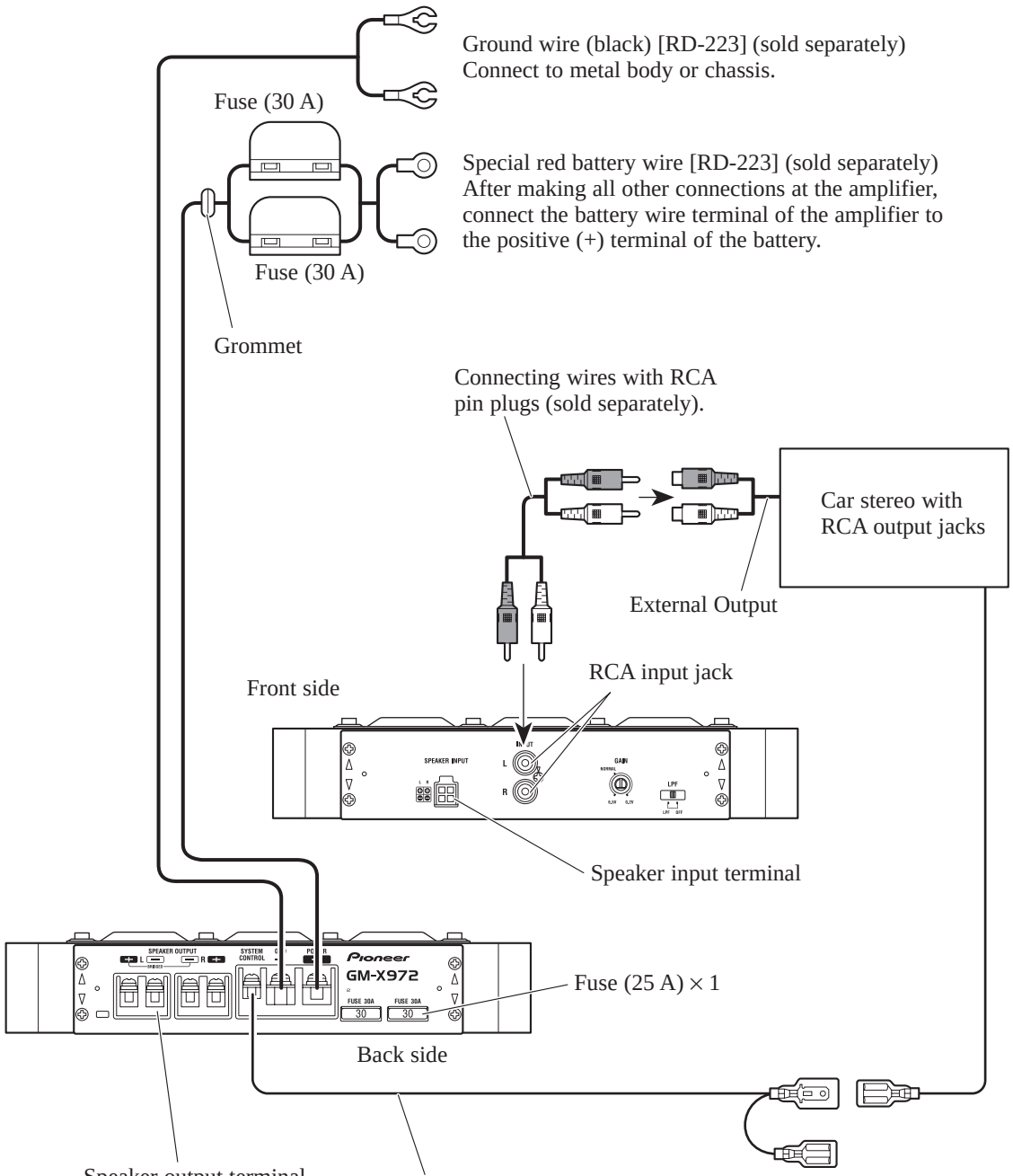
GM-X372/XH/EW
GM-X372/XH/ES

LPF (Low-Pass Filter) Select Switch

Set the LPF select switch as follows according to the type of speaker that is connected to the speaker output connector and the car stereo system:

LPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
LPF (left)	Very Low Frequency range	Subwoofer	Connect a subwoofer.
OFF (right)	Full range	Full range	

Connection Diagram


Ground wire (black) [RD-223] (sold separately)
Connect to metal body or chassis.
Fuse (30 A)
Special red battery wire [RD-223] (sold separately)
After making all other connections at the amplifier, connect the battery wire terminal of the amplifier to the positive (+) terminal of the battery.
Fuse (30 A)
Grommet
Connecting wires with RCA pin plugs (sold separately).
Car stereo with RCA output jacks
External Output
RCA input jack
Front side
SPEAKER INPUT
Speaker input terminal
Pioneer
GM-X972
Fuse (25 A) × 1
Back side
Speaker output terminal
See the “Connecting the Speaker wires” section for speaker connection instructions.
System remote control wire (sold separately)
Connect the male terminal of this wire to the system remote control terminal of the car stereo (SYSTEM REMOTE CONTROL). The female terminal can be connected to the auto-antenna relay control terminal. If the car stereo does not have a system remote control terminal, connect the male terminal to the power terminal through the ignition switch.